

IN THE CLAIMS:

The text of all pending claims, (including withdrawn claims) is set forth below. Cancelled and not entered claims are indicated with claim number and status only. The claims as listed below show added text with underlining and deleted text with ~~strikethrough~~. The status of each claim is indicated with one of (original), (currently amended), (cancelled), (new), (previously presented), or (not entered).

Please CANCEL claim 11 without prejudice or disclaimer, AMEND claim 1, and ADD new claim 13 in accordance with the following:

1. (CURRENTLY AMENDED) An apparatus for automatically changing a tool tip member for a robot, said robot operating in the condition that said tool tip member is threadedly mounted on a tool body mounted on a robot arm, said apparatus comprising:

a tip member changing jig disposed in an operational area of said robot;

a controller for controlling operation of said robot;

said tip member changing jig including a base member, a rotating member rotatably supported by said base member about a rotation axis, and tip member holding means for holding said tip member and disposed on said rotating member at a position that is offset from said rotation axis of said rotating member; and

said tip member holding means adapted to hold said tool tip member so that a central axis of relative rotation, for threadedly mounting the tool tip member on said tool body, extends substantially parallel to said rotation axis and rotation of said tool tip member, with respect to said rotating member, is locked; and

wherein said controller controls the operation of said robot arm of said robot to move said tool body around said rotation axis ~~while keeping said tool body around said rotation axis~~ while keeping said tool body in contact with said tool tip member held by said tip member holding means, thereby to rotate said rotating member about said rotation axis while bringing about the relative rotation between said tool body and said tool tip member so as to demount or mount said tool tip member from or to said tool body; and

~~wherein said tip member holding means has a rotation locking member for locking the relative rotation of said tool tip member with respect to said tip member holding means.~~

2. (CANCELLED)

3. (ORIGINAL) The apparatus according to claim 1, wherein said rotating member is

provided with means for detecting a rotational phase.

4. (CANCELLED)

5. (CANCELLED)

6. (CANCELLED)

7. (CANCELLED)

8. (CANCELLED)

9. (CANCELLED)

10. (CANCELLED)

11. (CANCELLED)

12. (PREVIOUSLY PRESENTED) An apparatus to automatically change a tool tip member used by a robot, the tool tip member being threadedly mounted on a tool body mounted on a robot arm of the robot, the apparatus comprising:

a tip member changing jig provided in an operational area of the robot, the tip member changing jig comprising:

a base member,

a rotating member rotatably supported about a rotation axis by the base member,

and

a tip member holder to hold the tip member, the tip member holder provided at a position offset from the rotation axis of the rotating member,

wherein the tip member holder holds the tool tip member such that a central axis of relative rotation to threadedly mount the tool tip member on the tool body extends substantially parallel to the rotation axis, and rotation of the tool tip member is locked with respect to the rotating member; and

a controller to control the operation of the robot arm to move the tool body around the rotation axis while keeping the tool body in contact with the tool tip member by the tip member

holder.

13. (NEW) An apparatus to automatically change a tool tip member used by a robot, the tool tip member being threadedly mounted on a tool body mounted on a robot arm of the robot, the apparatus comprising:

a rotating member;

a tip member holder provided on the rotating member at a position offset from a rotation axis of the rotating member;

wherein the rotating member is rotated so that the tip member holder rotates around the rotation axis of the rotating member while threading the tool tip member onto or off of the tool body on the robot arm.